



U. S. NAVAL HOSPITAL
Mare Island, Vallejo, California

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DOCUMENTS SECTION

29 December 1949

From: Officer in Charge, Artificial Limb Department
To: Commanding Officer

Subj: Monthly report on the experimental work of the Artificial Limb Department

Ref: (a) Advisory Committee on Artificial Limbs ltr of 21 Jun 1940
(b) Research Division ltr of 24 Jun 1949, BUMED CODE 71/DJD:gh

1. Monthly report required by references (a) and (b) is hereby submitted.
2. The following projects are under production, experimentation and further study:
(NM 007 084)

(a) Lower Extremities Section:

I. Foot and ankle (NM 007 084.30)

The laminated rubber blocks for the ankle joint have been tested in the ankle moment device and curves were plotted on the various combinations. The plotted curves show the desirability feature of increasing the difference between plantar and dorsiflexion. This allows for a great many more combinations in order to suit the individual needs of the various amputees. Using a 30 laminated rubber it is possible to get 1.7 inch pounds per degree in resistance to rotation. It has been found that resistance to rotation below 2" pounds is too weak especially when used with an AK conventional prostheses with a hip joint and pelvic band. The foot during the swing phase actually vibrates and the patients complain that it is too flexible. Resistances to rotation from three to ten degrees apparently are ideal amounts and appear to be acceptable to various individual amputees, some preferring a low resistance to rotation and other demand a higher resistance to rotation. It has been found that the longer the average patient walks on the functional ankle the less resistance in all motions are required. An amputee who has been wearing the conventional ankle generally desires to have a stiffer functional ankle especially when he first wears a functional ankle. Additional rubber ankle blocks with lamination some running partway through the block and others entirely through the block are being manufactured by the rubber laboratory in the Navy Yard. It is intended to test these in the ankle moment device when received.

II. Shank (NM 007 984.10)

The molds for the new shaped shin have been received in the Navy Yard and required alterations have been made. A new ankle block has been designed to fit in conjunction with the new shin. At the present time this work is progressing in a satisfactory manner.

III. Knee

(a) Mechanical (NM 007 084.32)

Patients who have been fitted with the variable cadence knee joints are accepting this device in a highly satisfactory manner and are greatly pleased with

it's function. Several changes in it's design have been done in order to simplify it and improve it from a production standpoint. An attempt is being made to change the variable cadence feature so that there would be a difference in the resistance between friction action in the beginning and at the end of the swing phase. This is being secured utilizing circumferential friction brake so that it wraps and unwraps in the two phases. This change has not been tried on an amputee, and it is undecided at the present time whether it would be a desirable change.

IV. Cosmetic Problem (NM 007 084.20)

No additional work has been done on the cosmetic problem this month.

V. Brief summary of status of models as a unit

(a) Soft socket (NM 007 084.16)

A BK soft socket made with the (Pros-to-form) plastic is proving to be a desirable material from a number of standpoints. One of the best advantages is the ability to utilize the same socket when the amputee's stump becomes smaller. This is readily done by taking the socket out of the shin, reheating it and reforming it again. If a small area in the sockets needs alterations this can readily be done by heating that area with a blow torch and pressing that area as required.

Specifications for a leg stump cone have been sent to Columbia Plastics of New Jersey, who have agreed to help develop suitable plastic similar to (Pros-to-form).

(b) Upper Extremities Section:

I. Above elbow arm (nm 007 084.17)

Additional locks are being manufactured to fit in the above elbow arm. One in use on an amputee continues to work satisfactorily.

II. Hands, hooks and tools (NM 007 084.18)

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One additional case has/fitted with the Robinson hand lock.

III. Cosmetic problem.

No work has been done on the cosmetic problem of the arm this month.

IV. Harness and/or other outside control (NM 007 084.21)

No additional work has been done on the harness this month.

V. Brief summary of status of models as a unit.

An APRL hook has been received from Colonel Fletcher and has been fitted to Lt. Gray, the bilateral above elbow cineplastic amputee. He is able to utilize this hook to advantage especially in it's improved strength of grip. The main disadvantage of the hook appears to be that if the amputee grips a hard object and closes the hook forcibly on it, he is then unable to release it. This feature should be corrected. Possibly the elimination of the back lash would correct this condition.

The back lash feature is not needed, when a soft or semi-soft object is grasped because the object itself will expand after the hook has taken hold and thus securing the object to the fingers of the hook.

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